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ORIGINAL PAPER

Palaeoecology of Famennian-Tournaisian (Late Devonian-Early Carboniferous) bryozoans from central and southern regions of Russia

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Abstract The palaeoecology of Famennian-Tournaisian (Late Devonian-Early Carboniferous) bryozoans from central and southern regions of Russia is analysed. Famennian-Tournaisian bryozoans associations of the Altai-Sayan Folded Area and the south-western region of the West-Siberian plate was a shallow-middle shelf according to our own and literature data. Robust branching-fenestrate-bilaminar bryozoan associations are found in locations of warm water, transitional low-high water energy, normal salinity and changing sedimentation rate. Bryozoan associations from South Urals and the central part of the Russian plate are characterised by a low number of species and specimens. Encrusting unilaminar and delicate branching growth habits are dominate in the Russian Plate and indicate an environmental setting in close proximity to strandline.

Keywords Bryozoa · Palaeoenvironments · Palaeozoic · Growth habit

Introduction

Bryozoa are a phylum of complex sessile colonial organisms, most of which are found in marine basins (Nelson et al. 1988; Amini et al. 2004). Calcified bryozoans first appeared in the Early Ordovician seas of China and diversified rapidly (Hu and Spjeldnaes 1991; Xia et al. 2007; Ma et al. 2015). The long evolutionary history, high taxonomic diversity, and ecological sensitivity of bryozoans provide important data on biological and geological interpretation, both in modern and ancient ecosystems (Osburn 1921; Cuffey 1974, 1977, 1985, 2006; Day and Osman 1981; McKinney et al. 1987, 2003a, b; Ernst and Königshof 2008; Lidgard 2008). In the geological sciences, bryozoans have been used in various disciplines, such as palaeoecology (Yaroshinskaya 1970; Hageman et al. 1997; Smith et al. 2006), palaeogeography (Cuffey 1977; Ross 1981; Buttler et al. 2013) and biostratigraphy (Nekhoroshev 1948; Bancroft 1987; Popeco 1995).

The ecological value of bryozoans was first documented by Stach (1936) who analysed early Cenozoic taxa from Australia. The general palaeoecology of Palaeozoic bryozoans has been outlined in several classic works (Nelson et al. 1988; McKinney and Jackson 1989). Several important studies have concentrated on faunas from various periods and have provided valuable data on the palaeoecology of these faunas. These studies include those on the Ordovician bryozoans of Estonia (Bassler 1911), western part of Altai-Sayan Folded Area within Russia (Yaroshinskaya 1970), Argentina (Ernst and Carrera 2008, 2012; Carrera and Ernst 2010), Silurian bryozoans of New York (Bassler 1906), Devonian bryozoans of Belarus (Pushkin 1996) and Western Sahara (Ernst and Königshof 2008), Carboniferous bryozoans of the USA (McKinney and Gault 1980) and the Russian Plate (Shulga-Nesterenko 1955), as well as Permian bryozoans of Urals (Trizna 1950), Tasmania (Reid 2010) and Spitsbergen (Nakrem 1994). However, a dedicated study on the palaeoecology of a Famennian-Tournaisian bryozoan

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